

REGISTRATION OF COMPONENTS
PROCESS PIPING IN BENZENE SERVICE

TABLE 1
LIST OF BY-PRODUCT PROCESS STREAMS

STREAM	DENSITY LB/CF	DENSITY G/CC	DENSITY G/MOLE OF GAS	BENZENE VOL %	BENZENE WEIGHT %
PRIMARY COOLER GAS	0.030381	0.000487	11.875568	0.8369%	5.36%
GAS FROM AXIES	0.030381	0.000487	11.875568	0.8369%	5.36%
TAR MAKE	0.311717	0.004994	121.846435	9.1912%	5.73%
LINDE GAS	0.029988	0.000480	11.721949	0.8393%	5.44%
REGENERATOR LOSS	0.199086	0.003189	77.820328	41.9955%	41.01%
SUBLIMATION GAS	0.073680	0.001180	28.800628	5.9210%	15.62%
UNDER FIRE GAS	0.023271	0.000373	9.096355	0.0221%	0.18%
LINDE EXIT GAS	0.022597	0.000362	8.832896	0.0038%	0.03%
SUB PLUS SEAL GAS	0.073680	0.001180	28.800628	5.9210%	15.62%
LIGHT OIL	0.216004	0.003460	84.433372	64.0228%	57.63%
H.C.N. TO DOWN RIVER	0.085816	0.001375	33.544445	6.6178%	14.99%
FEED TO CARBONATE	0.057463	0.000921	22.461597	0.0934%	0.32%
DESULFURIZED SUB GAS	0.054562	0.000874	21.327631	0.0991%	0.35%
CLAUS FEED	0.091283	0.001462	35.681429	0.0279%	0.06%
SULFUR	0.091150	0.001460	35.629441	0.0133%	0.03%
STACK LOSS	0.091786	0.001470	35.878046	0.0717%	0.15%
DR GAS TO DR OR UF	0.022597	0.000362	8.832896	0.0038%	0.03%
TAILGAS TO H BOX	0.022597	0.000362	8.832896	0.0038%	0.03%
METHANE	0.049152	0.000787	19.212927	0.0085%	0.03%

4.0 COMPLIANCE MONITORING PROGRAM REQUIREMENTS

The identification and monitoring requirements of Subpart L list specific methods for the identification and upgrading of piping components. The methods are as follows:

4.1 Piping Changes

Open ended lines are to be sealed with either a second valve, flange, plug, cap, or other equivalent method.

4.2 Identification Program

As specified in Section 138 and Subpart V, all components in benzene service will be identified and registered. The program has developed the identification of such components. These components have been tagged with a clearly legible, weatherproof tag. Tags used initially for the Clairton program were stamped aluminum attached with stainless steel wire. New laminated tags have been used for replacement purposes and in new areas. Appendix B contains a complete listing of the components found in benzene service. The tables in this appendix provide a list which refers to a line schematic on which the component is depicted. The tables also provide the type of service for which the component is operated (vacuum and liquid or vapor), accessibility of component, benzene concentration, plant ID where known, and monitoring frequency.

Included in Appendix C are line schematics which depict the process line in which the components are located. The drawings are offered to allow the location of such devices during the monitoring programs. Also included in Appendix C is an index of the drawings which includes a summary of the components in benzene service.

4.3 Monitoring Programs

All equipment will be monitored according to the scheduled frequency of the tables in Appendix B. The monitoring procedure will follow US EPA Reference Method 21. A copy of the method is included in Appendix D. Any equipment showing a monitor

response greater than 10,000 ppm as hexane is considered to be leaking. Leaking components must have the initial repair attempted within 5 days of the determination and must be repaired within 15 days. To facilitate this repair program, a field tag will be attached to the leaking component along with the identification tag. Also, a repair form will be filled out initiating the repair procedure. The form, as shown in Figure 1, provides documentation of the dates and personnel making the determination of the leak, the initial repair, and the final repair. The repair forms will be included with the record keeping with each accessible component having been marked with a weather proof identification tag, which will be referenced in reports.

An attempt to monitor components which are listed as inaccessible will occur once per year. Accessibility is documented in Appendix B.

Monthly monitoring will continue as scheduled where required. If such results provide data showing no leak (< 500 ppm) for two months, the component will be designated. Designation allows for the monitoring to be discontinued until the first month of the following quarter. If this result is obtained for four consecutive quarters, monitoring of the component will be performed annually until such time that a leak is determined.

Quarterly monitoring of devices such as AXIAL compressors demonstrating no leak can also be designated. If emissions are less than 500 ppm, they may be designated and monitored only on an annual basis.



3000 TECH CENTER DRIVE
MONROEVILLE, PA 15146

NAME

DATE

DRAWN

CHECKED

BENZENE NESHAPS PROGRAM - LEAKING COMPONENT REPORT		
Component I.D.:	Date Tested:	
Location:		
Results:	Operator:	
Initial Action (5 Days)		
Date Completed:		
Activity:		
Authorized Signature:		
Final Action Taken (15 days)		
Date Completed:		
Activity:		
Authorized Signature:		
Additional Monitoring		
2nd Month:	Date:	Reading:
Quarter 1	Date:	Reading:
Quarter 2	Date:	Reading:
Quarter 3	Date:	Reading:
Quarter 4	Date:	Reading:
Quarter 5	Date:	Reading:
Additional Information and Comment		

TITLE REGISTRATION OF COMPONENTS; PROCESS PIPING IN
BENZENE SERVICE
US STEEL CLAIRTON WORKS

FIGURE 1
LEAKING COMPONENT
REPORT

4-2a

ACTIVITY
NO.

REVISION

5.0 REPORTS AND RECORD KEEPING

The various portions of the monitoring and inspections programs require record keeping procedures to be developed and maintained. All records developed are required to be maintained for a two year period. These records are to be kept in a readily accessible area of the operating facility. The plant is required to keep on file detailed schematics of equipment in benzene service, including dates and descriptions of any system changes.

A record of monitoring and annual inspections indicating abnormalities and the presence and status of leaks are to be maintained for two years. The records which will be kept for process piping in benzene service include the complete registration of fixtures in this service. The registry will be updated should any changes in hardware occur. Records of all monitoring activity will be kept with this file. In addition, all repair activity generated by the monitoring activities will be documented with documentation retained in the same manner for two years.

A semiannual report will be submitted to United States Environmental Protection Agency or its authorized agency detailing leaks detected and repaired, visible defects or abnormalities and results of any performance tests. The reports are due six months after the issuance of this report, and every six months thereafter. Reports will be provided for the following agency representatives:

Edwin B. Erickson, US EPA, Regional Administrator
James Salvaggio, PA DER
Charles Goetz, Allegheny County Department of Health

6.0 CURRENT MONITORING PROGRAM

Monthly field inspections for determination of volatile organic compound emissions from components in benzene service have been conducted since December of 1989. During the first two months all accessible and in use systems were monitored. Following this initial period all non-leaking components were monitored on quarterly bases, leaking components continued on a monthly basis. It should be noted that the plant contains an extensive system to wash regenerators with methanol and light oil. This system has only been monitored when in service at time of monitoring, the wash system is only used a few days each month.

The methodology utilized for the determination was EPA Method 21 as found in 40 CFR 60 Appendix A, as corrected December 23, 1983. This method describes the selection and calibration of monitoring equipment as well as procedures used in actual source monitoring. A copy of this procedure is found in Appendix D. The monitoring survey was conducted with a Thermo Environmental Model 580S Intrinsically Safe Organic Vapor Meter equipped with an 11.8 eV source.

During the past year 28 components in benzene service were found to be leaking or to have hydrocarbon readings in excess of 500 ppm. These are listed in Appendix E.

The calibration gas used for leak level determination in this program is a 9800 parts per million by volume (ppm) hexane in nitrogen mixture. This is diluted with air for reference points of 500 and 1000 ppm for the development of a response curve. Dilution is accomplished by blending air and calibration mix in a Dasibi Model 1005-C Gas Dilution System. Three points are run prior to the survey trip and one point after. Additionally, a two point response factor calibration run using benzene at the 500-700 ppm and 10000 ppm levels is made. This data is supplied in Appendix F.